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ACUTE POLIOMYELITIS

By EMMA MOYNIHAN, R.N.

Sauk Center, Minnesota

At a recent gathering of nurses in St. Paul, the question was asked, several times: "Who can tell us something about anterior poliomyelitis?" This interest may have been aroused by the alarming prevalence of this dread disease in certain sections throughout Minnesota, the epidemic lasting from August 1, 1915, when the first case was reported, until November 23, following.

In our own county, within a radius of ten miles, there were fifty-nine cases. At that time, I was working with Dr. Moynihan, health officer of this and several surrounding communities, and was fortunate enough to see some very interesting cases. Thinking that other nurses may be glad to know something of the nature and care of this disease, I am setting down what we have learned. Dr. Chesley, of the Division of Preventable Diseases of the Minnesota State Board of Health, very kindly furnished me with the statistics and a list of references.

Acute poliomyelitis is a rapidly developed inflammation of the anterior horns of the grey matter of the spinal cord, occurring suddenly in children, occasionally in adults, characterized by mild fever, slight cold, or sore throat, intestinal disturbances, tremors, twitchings and paralysis of groups of muscles, followed, generally, by a considerable degree of spontaneous improvement, except in certain groups of muscles which may remain permanently paralyzed and undergo a rapid and marked atrophy.

Like cerebro-spinal meningitis, it is endemic throughout the United States. Sporadic cases are likely to develop in any community and, under certain unknown conditions, the disease becomes epidemic. Auerbach claims that one attack does not preclude a second, though it has been shown that a district ravaged one year, was spared the following. A study of reports of epidemics would indicate "a lack of repetition in identical communities but repeated outbreaks in certain general vicinities."

This disease seems to follow along great travel routes where there is prolonged exposure to animal, especially horse, feces. It is more prevalent among rural than city dwellers and while the particular child

affected may be exceptionally robust and active, with a good appetite for a general diet, it is, as a rule, not the children of well-to-do parents who are afflicted, but rather those living in neglected localities, having no idea of food values, and largely of foreign extraction.

Epidemics usually occur during the hot, dry, dusty months of June, July, August, September and October which time is also the period of greatest activity for the fly, especially the stable fly.

The theory that the virus may be contained in dust is borne out by our own experience here in Sauk Center. On September 13, 1915, a young man employed in a bank was taken down very suddenly late in the afternoon. At almost the same hour a small child, who later died, showed identical symptoms. There was no history of exposure in either case and it may have been a mere coincidence, but ten days before we had been visited by a severe windstorm during which great clouds of dust swept down the streets.

Heredity has no effect in the production of this disease which is, as a rule, only slightly contagious. Dr. Greene, in his report for 1913 to the Minnesota State Board of Health, states that in 280 families, 1583 persons were exposed to 275 initial cases and out of that number only 25 developed poliomyelitis after the initial cases appeared. Only one case developed in 263 families, 2 developed in each of 14 families, 3 in each of 3 families and none had more than 3.

Dr. Simon Flexner of the Rockefeller Institute, claims (and it is the accepted belief) that the infection gains entrance to the system through the mucous membranes of the nose and throat. It is then carried by the lymphatics to the spinal fluid and thence to the nerve tissues. The exact nature of this virus is unknown but it is probably some germ too small for our present microscopes. Dr. Flexner has proved that this minute organism can be filtered through unglazed porcelain and that spinal fluid, withdrawn before paralysis occurred, has caused a like infection in monkeys. This virus produces an inflammation which causes crowding and the subsequent destruction of certain nerve cells, the destruction of which means loss of function in the nerve and paralysis of the muscle which that nerve controls.

While little is known of the exact mode of transmission, the nose and throat secretions, and possibly bowel and bladder discharges, are thought to contain the germ, and there is the greatest danger through contact with mild abortive cases where no paralysis exists or with a possible healthy "carrier." It is hard to say who a "carrier" is but it would seem to be some one who has been in contact with a case of poliomyelitis. Such a person should keep away from children for at least two weeks after the last exposure.

The death rate in this disease is usually low, sometimes as low as 4 per cent. The present epidemic in New York, however, is characterized by a particularly high death rate, approximately 25 per cent, I believe. While the disease may not be fatal, the deformity resulting may range from a mere feeling of great fatigue and a refusal to move about for a few days, to complete paralysis of one or both legs or a general paralysis of both upper and lower extremities and more or less of the trunk, or of one upper and one lower extremity, or of the throat, or of one side of the face.

In the epidemic around St. Cloud, 56 per cent of the paralyzed cases were under five years of age and 81 per cent of all the cases were under ten years, though this is not entirely a disease of childhood. Twenty-seven abortive cases gave histories of exposure. There had been picnics, a Labor Day celebration and a county fair just previous to the outbreak, which would seem to substantiate Dr. Flexner's claim that the virus is spread chiefly through contact. Diagnosis of poliomyelitis is not easy until the paralysis appears. It sometimes presents all the symptoms of cerebro-spinal meningitis, but when a lumbar puncture is made and the spinal fluid withdrawn, instead of the typical cloudy, cell-filled fluid, it is clear and colorless; or there may be only slight fever and some irritability. In one case, a beautiful little girl of three, a physician was not called, as it seemed only a mild intestinal disturbance. On the third day, however, when the fever had disappeared and the mother attempted to stand the child on her feet, she fell to the floor and has been unable to walk without a brace since.

We had a typical case in September, 1915. The patient was a poorly nourished little girl, aged nine, who walked two miles each day to and from school, taking a cold lunch with her. The day before, she had been in school as usual. During the night she had a chill, temperature of 103°, and complained of severe pains in the abdomen. Repeated doses of castor oil gave no results. The following day calomel in small doses was administered and still no results. The temperature ranged from 101° to 103° and the pulse was about 120. There was pain in the abdomen, severe, slight sore throat and cold in the head.

The doctor, who was out of town when first called, saw the child on the third day. He found the abdomen distended and rigid, pain severe, nausea and vomiting, and still no bowel movement. Hot turpentine stupes were applied and a high enema given. Good results were obtained and the distention subsided, the abdomen becoming soft. On the fourth day she complained of a slight stiffness in the neck, pain in the back on moving and inability to move her legs, which were

cold and clammy. She was slow in urinating, though the bowels had now moved freely.

On the fifth day she was unable to urinate and from then on was catheterized. She had no control over the bowels and both arms were now affected. The head was slightly drawn and the wasting of tissues was marked. During all this time there was no delirium, only a fretful irritability.

On the sixth day the respirations averaged 40. (This indicated an involvement of the respiratory muscles and is a grave condition.)

From then on until she died, ten days after the appearance of the first symptom, there was no change and no improvement.

Another case is reported from St. Cloud. It demonstrates how very sick a patient may be and still make a complete recovery. A young man, aged 24, was taken suddenly in the night, manifesting all the symptoms of acute appendicitis. He was hurried to a hospital in an adjoining town. The blood count showed no leucocytosis. There was, however, severe abdominal pain localized in the lower right quadrant, fever and vomiting. Though there was small hope of his recovery, an operation was deemed advisable. The intestines were found mottled like a beginning thrombosis of the mesenteric artery but there was no local lesion, the appendix being normal. Thirty-six hours later, paralysis of the lower extremities was evident. Both legs, the bowels and bladder were involved. He remained seven weeks in the hospital and it is now ten months since the appearance of the first symptom. He is back at work, and walks without a cane, a slight dragging of the right leg being the only after-effect.

I know of no disease, aside from typhoid, that so requires trained nursing, but unfortunately, the families afflicted are usually unable financially, to employ a nurse.

Isolation is the first consideration. The nose and throat secretions, as well as the bowel and bladder discharges, must be disinfected before being disposed of. Flies and all domestic animals must be excluded. The case should be immediately reported to the health officer and if there are other children in the family, they must be removed from school at once.

The period of incubation is thought to vary from a few hours to as much as twenty-three days, so that no child from an infected family should be permitted to return to school for at least three weeks. Dr. Kling thinks that the virus soon loses its virulence, while Doctors Lucas and Osgood claim to have found it in the nasal secretions four months after the acute stage had passed.

There are certain mild abortive forms of this disease which manifest all the symptoms, except the paralysis. Such cases are most dangerous agents in the spread of the disease.

The treatment during the acute stage is to relieve congestion as much as possible by free but gentle catharsis. Calomel, syrup of rhubarb, and castor oil are good and some doctors order a saline. The child should be urged to urinate at least every four hours.

As the fever seldom goes higher than 103°, the patient should not be disturbed to give frequent baths. Should it rise higher, however, or the child be very restless, sponging with warm water is advised. Cold sponging and cold applications are best not employed in this disease, as they have a tendency to increase the congestion of the central nervous system.

In all cases pain must be controlled. For a young child, deodorized tincture of opium, gtt. i, every hour till five are taken or until the child is sleeping or quiet, is a good method.

The sick room should be quiet and darkened and removed as far as possible from all household activities. No visitors, of course, should be allowed and unnecessary talking and moving about should be avoided.

During the acute stage, food should not be pushed but water may be freely given. Later, milk, cereals and all starchy foods are indicated and the child should be urged to eat, as the best means of repairing the enormous tissue waste.

Local treatment during the acute stage is simply keeping the affected parts at rest. Sand-bags beside the head and body and cushions to keep the limbs straight and the feet in position are important. The foot should always be at right angles to the leg, which should be held in such a position as to prevent pulling on unaffected muscles.

Paralysis of the leg is about four times as common as any other form and the quadriceps is the muscle most frequently affected. Next comes the tibialis anticus and the anterior muscles of the lower leg. Gentle massage may be begun early in the subacute stage. It is a great aid to the nutrition of the affected parts. The child should be encouraged to make every effort to move the limb, as a voluntary contraction is of much greater value than any amount of passive reaction.

Electricity should never be applied until all active inflammation in the cord has subsided which is usually from three to eight weeks. If the muscles do not react to the faradic current, the prognosis is grave.

However, the greatest improvement is caused by rest in bed, fresh

air, good nourishing food taken frequently, warm baths and graded exercise.

Muscles regain their tone even after a year though there is, as a rule, really little improvement after two years.

In a disease about which so little is known, a nurse should make every effort to assist the doctors in their untiring efforts to locate the exact cause and mode of transmission. Each little detail and any unusual symptom should be noted and reported, as it is the little things that count in the long run.

EXPERIENCES OF A PUPIL NURSE

BY LOUISE N. HAZLEHURST, R.N.

Macon, Georgia

A patient was admitted to the ward from south Georgia, a veritable "Georgia cracker." When I told her to get into the tub, she was amazed and said, "I see plenty of hole here, but nary a plug." I explained the mysteries of the bath tub and then she replied, "You want me to streeep and get into that thing?" I told her to streeep and be in the tub when I returned with her gown and towels. Imagine my amazement when I entered the bathroom and saw the poor little emaciated creature, huddled up, "streeeped" and in the tub, with a forlorn little green hat, with purple feathers, the worse for wear, adorning her head.

A boy of five summers was admitted to the Out-patient Department, accompanied by his mother. The attending physician requested me to prepare the child for examination. When the mother observed that I was expected to undress him, she exclaimed, "Nurse, don't do that, he is sewed up for the winter."

As a probationer, I overheard a conversation between two little fellows who had swallowed potash with a resulting obstruction in the oesophagus and who were known as The Little Oesophagi. One said "Nick, does you know what the new nurse's name is?" "Sure I does, her name is Miss Hazle-Nurse."